

*The Coxal Gland of the Scorpion and its Morphological Relations with the Excretory Organs of the Crustacea*\*. By M. PAUL MARCHAL.

We know that the coxal gland of the Scorpion consists of two portions, a medullary and a cortical substance.

The structure of the medullary substance has not yet been elucidated by authors. It presents two very distinct classes of lacunæ which have hitherto been confounded. The first of these are the glandular lacunæ: they are for the most part extremely narrow, and their lumen is often filled by glandular epithelium, which may cause them to pass unnoticed; this epithelium presents a similar aspect to that of the sac of the antennary gland of the Crustacea. The second kind are the blood-lacunæ: they are wide and may be distinguished at once from the former class by the fact that they are limited by a membrana propria separating the glandular epithelium from the sanguineous fluid, and appearing in sections as a refringent line; moreover the blood-lacunæ are often filled by a coagulum presenting a punctate appearance.

The glandular lacunæ anastomose with one another so as to constitute a spongy plexus, and open into a central lacuna much wider than the others; this larger lacuna plays the part of the ramified sac of the marine Decapod Crustacea, and inosculates directly with the long tube which constitutes the cortical substance.

This communication between the medullary and the cortical substance, the existence of which is of the greatest interest from the present point of view, had not hitherto been seen in the adult. It presents a striking analogy to that between the sac and the labyrinth of the antennary gland of the Crustacea. Around the orifice we find the same clear columnar cells, swollen at their free extremity and narrow at their base; the passage between the epithelia of the two portions which are so different from one another is equally effected without a noticeable transition: immediately the orifice is passed we meet with the cells which are striated in their basal portion and are characteristic of the cortical substance.

In the Crustacea, at least in the Decapods, which are the only ones that I have studied, the sac is perfectly isolated, and it is always possible to distinguish its epithelium from the connective tissue, otherwise much reduced, which surrounds it. It is not the same with the medullary substance of the coxal gland of the Scorpion: at its periphery, and especially at the level of its anterior portion, which is free and constitutes the hilum of the gland, the glandular lacunæ become purely virtual intercellular passages, and end by being entirely filled up; from this there results the formation of

\* The species which was the subject of my observations was *Scorpio occitanus*. For the specimens upon which this investigation was conducted I am indebted to the kindness of Prof. de Lacaze-Duthiers, who had them sent to me alive from the Arago Laboratory at Banyuls-sur-Mer.

clusters of cells which become insensibly united with the surrounding connective tissue, without its being possible to say where the glandular tissue commences and where the connective tissue ends. It was on account of this arrangement that Ray Lankester, who, moreover, was not aware of the communication between the medullary and the cortical substance, and of the double lacunar system constituted by the sanguineous and the glandular lacunæ which I have just described, regarded this medullary substance as being formed by a connective tissue of a special kind, the nature of the empty spaces of which remained problematical to him: nevertheless his shrewdness led him very justly to consider this medullary substance as probably corresponding to the sac of the antennary and shell-glands of the Crustacea.

The structure of the cortical substance of the coxal gland of the Scorpion is actually known. I shall therefore confine myself to stating that the injections which I have made of it with celloidin and asphalt have entirely confirmed the current opinion, which regards this substance as being formed of an extremely long tube coiled a very great number of times upon itself. The mould which is obtained by this method gives a demonstration of this structure which is conclusive in a very different way from that hitherto derived by authors from the method of sections. This tube communicates by one of its extremities with the medullary substance, and I may remind the reader that, as has recently been shown, it opens to the exterior by the other at the level of the base of the third pair of limbs.

The secretion of the cortical substance is effected by elimination of large vesicles at the extremity of the cells in a manner similar to that which we have described in the Crustaceans. The cells of the medullary substance frequently present sharp constrictions, or a biscuit-shape, which indicate a mode of secretion analogous to that of the sac in many of the Decapods.

*Conclusion.*—It follows from the foregoing that the antennary and shell-glands of the Crustaceans, as well as the coxal gland of the Arachnids, may with reason be considered as organs of the same nature. The morphological significance of the sac of the Crustaceans is moreover found to be elucidated by the study of the medullary substance of the coxal gland of the Scorpion; and the opinion of Lankester, who was led to consider the epithelium of the sac as being formed by differentiated connective tissue, its cavity being a portion cut off from the cœlome, isolated and adapted to excretion, thus receives entire confirmation: the glandular lacunæ of the medullary substance of the Scorpion may in fact be considered as being excavated in the midst of a differentiated connective tissue.

The antennary gland of the higher Crustaceans, the shell-gland of the lower, and the coxal gland of the Arachnids, communicating, as we have seen, on the one side with the exterior, on the other with a cavity which may be considered as a derivative of the cœlome, may be regarded with much probability as forming part of a meta-

meric series comparable to that of the segmental organs in the Worms.—*Comptes Rendus*, t. cxv. no. 3 (July 18, 1892), pp. 191–193.

*On the Freshwater Fauna of Iceland.*

By MM. JULES DE GUERNE and JULES RICHARD.

In spite of their extreme abundance, and although numerous explorations have been made in the country, the fresh waters of Iceland have never been properly studied from a zoological point of view. M. Charles Rabot was able partly to supply this deficiency in the course of a scientific mission carried out in 1891, during the months of July and August. The collections were made in three different districts of the island:—(1) in the north, at Akureyri; (2) in the west, in the vicinity of Reykjavik; (3) in the east, in the region of the Eskifjord. The examination of them enables us to add *twenty-nine* species to the Icelandic fauna, among which the Entomostraca, which are by far the most numerous, amount to *twenty-six* (16 Cladocera, 8 Copepoda, 2 Ostracoda). The remainder include only 2 Rotifera and 1 Protozoon. Not one of these forms is new, but several of them are of genuine interest for different reasons which are stated below.

It is worth noticing in the first place that a certain number of species which are common throughout the whole of Europe (and even in the United States) are found in the three regions of Iceland visited by M. Rabot. These are *Simocephalus vetulus*, O.-F. Müller; *Alona affinis*, Leydig; *Chydorus sphericus*, Jurine; *Cyclops strenuus*, Fischer; *C. viridis*, Fischer; and *C. serrulatus*, Fischer. Certain other forms, which are likewise very widely distributed in Europe, appear to be rarer in Iceland. *Daphnia longispina*, Leydig, *D. pulex*, de Geer, and *Cypris pubera*, O.-F. Müller, for instance, were only found in the Lake of Reykjavik in the case of the first, and at Akureyri in that of the other two. On the other hand, *Eurycerus lamellatus*, O.-F. Müller, *Acroperus leucocephalus*, Koch, *Pleuroxus excisus*, Fischer, and *Polyphemus pediculus*, de Geer, are absent only in the latter of these localities. *Alona testudinaria*, Fischer, a tolerably rare form, and *Cyclops fuscus*, Jurine, were only found in the east. *Pleuroxus nanus*, Baird, on the contrary, was met with only in the western region. *Cyclops fimbriatus*, Fischer, lives in the pit of a spar-mine near Eskifjord equally as well as in the waters of the Laugarvatn, where there is also found, just as in the Lake of Reykjavik, an undetermined species of *Canthocamptus*. *Cypris aculeata*, Lilljeborg, is found in great abundance on the shores of the same lake.

Near Reykjavik, in Lake Thingwalla, which is the largest in Iceland, M. Rabot collected the following Crustaceans:—*Scapholeberis mucronata*, O.-F. Müller; *Bosmina arctica*, Lilljeborg; *Eurycerus lamellatus*, O.-F. Müller; *Acroperus leucocephalus*, Koch; *Alona affinis*, Leydig; *Chydorus sphericus*, Jurine; *Polyphemus pediculus*, de Geer; *Diaptomus minutus*, Lilljeborg; *Cyclops strenuus*,